



Performance Evaluation Report for the A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) and the Miscellaneous Chemical Basin/Metals Burning Pit (731-4A, -5A) Operable Unit

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LIST OF ABBREVIATIONS AND ACRONYMS

~	approximate, approximately
ABRP	A-Area Burning/Rubble Pits and Rubble Pit
asl	above sea level
ASVE	active soil vapor extraction
B&K	Bruel and Kjaer
bgs	below ground surface
cfm	cubic feet per minute
cis-1,2-DCE	cis-1,2-dichloroethylene
CM	contaminant migration
CMI/RAIP	Corrective Measures Implementation/Remedial Action Implementation Plan
COC	constituent of concern
CY	calendar year
ft	feet or foot
hr	hour
IROD	Interim Record of Decision
kg	kilogram
km	kilometer
lb	pound
LLC	limited liability company
µg/kg	microgram per kilogram
µg/L	microgram per liter
m	Meter
MAAZ	M-Area Aquifer Zone
MBP	Metals Burning Pit
MCB	Miscellaneous Chemical Basin
MCL	maximum contaminant level
mi	Mile
NA	not applicable
ND	non-detect
OU	operable unit
PCE	Tetrachloroethylene
PCR	Post-Construction Report
PER	Performance Evaluation Report
ppmV	parts per million by volume
PSVE	passive soil vapor extraction
RA	remedial action
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act

LIST OF ABBREVIATIONS AND ACRONYMS *(Continued/End)*

RFI/RI/BRA	RCRA Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment
RG	remedial goal
ROD	Record of Decision
SCDHEC	South Carolina Department of Health and Environmental Control
SEMS	Superfund Enterprise Management System
SRNS	Savannah River Nuclear Solutions, LLC
SRS	Savannah River Site
SVE	soil vapor extraction
SVEU	soil vapor extraction unit
TCE	Trichloroethylene
USEPA	U.S. Environmental Protection Agency
UTM	Universal Transverse Mercator
VOC	volatile organic compound
WSRC	Washington Savannah River Company LLC

1.0 INTRODUCTION

This Performance Evaluation Report (PER) addresses remedial system performance at the consolidated A-Area Burning/Rubble Pits (731-A, -1A) and Rubble Pit (731-2A) (ABRP) and Miscellaneous Chemical Basin (MCB)/Metals Burning Pit (MBP) (731-4A, 5A) Operable Unit (OU) for calendar year (CY) 2018. Monitoring requirements for ABRP/MCB/MBP are identified in the Corrective Measure Implementation/Remedial Action Implementation Plan (CMI/RAIP) (WSRC 2006) and Post-Construction Report (PCR) for the ABRP/MCB/MBP OU (SRNS 2009a). For additional information, refer to previous PERs (Savannah River Nuclear Solutions, LLC [SRNS] 2016, 2018a, and 2018b).

1.1 ABRP Area Subunits

The ABRP/MCB/MBP OU is located approximately (~) 2.4-kilometers (km [1.5-miles {mi}]) south of M Area and 4.8-km (3-mi) east of the Savannah River Site (SRS) boundary, in the Upper Three Runs watershed (Figure 1). The ABRP/MCB/MBP OU comprises several waste sites. This PER specifically addresses the remedial actions (RAs) conducted at the ABRP Trench (vadose zone soil) Subunit and the 731-4A MCB Vadose Zone Subunit. The RA for all ABRP/MCB/MBP OU subunits is summarized in Section 2.

The Trench Subunit (outlined in blue on Figure 2), located beneath the A-Area Ash Pile (788-2A), has been identified as a source for volatile organic compound (VOC) contamination. Trichloroethylene (TCE) was identified as a contaminant migration (CM) constituent of concern (COC) for the Trench Subunit. Contamination leaching from this area has impacted vadose zone soils and groundwater beneath ABRP. A detailed facility description is provided in the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation Report with Baseline Risk Assessment (RFI/RI/BRA) (WSRC 1997) and the Addendum to the Revision 1.2, RFI/RI/BRA (WSRC 2003a).

1.2 MCB/MBP Subunits

The MCB (731-4A) Subunit (Figure 2) is believed to have been a disposal site for solvents and oils based on the type of contamination in the vadose zone and groundwater beneath the area. TCE and tetrachloroethylene (PCE) were identified as CM COCs at MCB.

1.3 Groundwater

Groundwater is not part of the ABRP/MCB/MBP OU. The Core Team representatives from the U.S. Environmental Protection Agency (USEPA), South Carolina Department of Health and Environmental Control (SCDHEC), and U.S. Department of Energy - SRS, agreed to transfer responsibility for the ABRP/MCB/MBP groundwater from the Federal Facility Agreement to the RCRA program as part of the M-Area VOC plume under the *2000 RCRA Part B Permit Renewal Application: M-Area and Metallurgical Laboratory Hazardous Waste Management Facilities Postclosure* (SRNS 2018c).

Monitoring wells screened in the water table aquifer (M-Area Aquifer Zone [MAAZ]) near the ABRP and MCB source areas have historically shown elevated levels of PCE and TCE contamination. TCE and PCE concentrations observed in the monitoring wells located in the Lost Lake Aquifer Zone are impacted from upgradient M-Area sources in addition to ABRP/MCB sources. In the Upper Lost Lake Aquifer Zone, wells near the source areas have had historically elevated TCE concentrations that have decreased with time indicating less M-Area influence. Monitoring wells in the Lower Lost Lake Aquifer Zone have had stable TCE concentrations with minimal change over time indicating more influence from upgradient M-Area sources.

Soil vapor extraction (SVE) is designed to reduce the vadose zone source term and has a delayed impact on groundwater contamination by inhibiting further contamination. SRS expects to see a long-term impact on groundwater contamination from SVE operations in shallower groundwater; however, deeper groundwater impacts from this system may be less apparent due to commingling of the plumes. Therefore, it is important to focus on the MAAZ (water table aquifer) wells when evaluating the effectiveness of the vadose zone remedial actions. MAAZ wells near the ABRP source have decreasing VOC trends indicating mass depletion of the source. PCE is below the

groundwater maximum contaminant level (MCL) in all eight MAAZ wells and TCE exceeds the MCL in only two wells.

2.0 REMEDIAL ACTIONS

The final RAs are ongoing for the ABRP Trench Subunit and the MCB Vadose Zone Subunit. In 2018 the ABRP RA and the MCB RA were comprised of passive SVE (PSVE) with MicroBlowers™ and BaroBalls™. All MicroBlowers™ are equipped with BaroBalls™ for backup operation. Performance of these RAs is the subject of this PER.

The RAs and the regulatory decision documents for the eleven ABRP/MCB/MBP OU subunits (Figure 2) are listed below:

ABRP Area Subunits

- Trench (vadose zone soil) Subunit — RA is ongoing. The final RA (WSRC 2007, SRNS 2009a) consists of operating PSVE, 13 wells equipped with MicroBlowers™ and 13 wells equipped with BaroBalls™ (Figure 3). The PSVE meets the remedial action objective (RAO) to prevent migration of TCE contamination in soil to groundwater at a concentration above the MCL of 5 µg/L. The final remedial goal (RG) for TCE in the soil at the Trench subunit is 610 µg/kg.
- 731-2A Rubble Pit Subunit — RA is complete (WSRC 2000a, WSRC 2003b). The RA for benzo(a)pyrene contamination in surface soil at the 731-2A Rubble Pit consisted of a 0.3-meter (m [1-foot {ft}]) thick soil cover.
- 788-2A Ash Pile Subunit — RA is complete (SRNS 2009a). The RA for arsenic, selenium, potassium-40, radium-226, radium-228, thorium-228 and uranium-238 contamination in the 788-2A Ash Pile was a minimum 0.6-m (2-ft) thick vegetative soil cover and institutional controls (i.e., land use controls). The RA meets the RAOs to prevent human exposure to COCs that present a risk to future industrial workers and to prevent ecological exposure to COCs that present a hazard to ecological receptors.
- 731-A Burning/Rubble Pit Subunit — No RA required (WSRC 2000a)

- 731-1A Burning/Rubble Pit Subunit — No RA required (WSRC 2000a)
- Potential Pit Subunit — No RA required (WSRC 2000a)
- Depressional Area Subunit — No RA required (WSRC 2000a)
- Ash Scatter Area/Ditch Subunit — No RA required (WSRC 2001)

MCB/MBP Subunits

- 731-4A MCB Vadose Zone Subunit — RA is ongoing. The final RA (WSRC 2007, SRNS 2009a) consists of operating PSVE, 2 wells equipped with MicroBlowers™ and 24 wells equipped with BaroBalls™ (Figure 4). The 26 PSVE wells installed as part of the interim RA (WSRC 1999, WSRC 2002a) were deemed sufficient to meet the RAOs of the final RA to prevent migration of TCE and PCE contamination in soil to groundwater at a concentration above the MCLs (5 µg/L for each). The RGs for TCE and PCE in the soil at the MCB Vadose Zone subunit are 344 µg/kg for each compound.
- 731-4A MCB Surface Soil Subunit — RA is complete (WSRC 1999, WSRC 2002a). The RA for soil containing polychlorinated biphenyls at MCB was excavation and off-SRS disposal.
- 731-5A MBP Surface Soil Subunit — RA is complete (WSRC 1999, WSRC 2002a). The RA for elevated levels of aluminum in MBP surface soils was excavation and off-SRS disposal.

2.1 ABRP Trench Subunit

2.1.1 Treatment Area

The treatment area for the ABRP Trench Subunit was established by the ABRP/MCB/MBP CMI/RAIP (WSRC 2006) based on the soil RG of 610 µg/kg for TCE concentration contour as shown in Figure 3. To identify the areas exceeding the RG, the CMI/RAIP composited the sampling results provided by extensive soil sampling and cone penetrometer characterization conducted between 1996 and 2004. This sampling provided sufficient data to identify the contaminated area and SVE design requirements.

2.1.2 *Historical Information*

Characterization

VOC contamination (i.e., TCE, PCE, cis-1,2-dichloroethylene [cis-1,2-DCE]) in groundwater was initially addressed in 2000 by an Interim Record of Decision (IROD) (WSRC 2000a) as an interim action at the ABRP OU. Characterization of the Trench Subunit occurred in April 2001 (WSRC 2003a). Following characterization activities, an Explanation of Significant Difference (WSRC 2001) to the IROD was issued in 2002 to expand the SVE portion of the interim action to include the Trench Subunit where VOCs were identified at levels that would likely leach to groundwater. In 2002, the CM analysis of the Trench Subunit revealed that although TCE, PCE, and cis-1,2-DCE were present in vadose zone soils, only TCE was present at levels that could potentially migrate to groundwater above the MCL. Thus, the Addendum to the RFI/RI/BRA for the ABRP (WSRC 2002b) and the 2007 Record of Decision (ROD) identified TCE as the only CM COC in the Trench Subunit. The approved ROD for the ABRP/MCB/MBP OU (WSRC 2007) selected phased SVE as the RA for the Trench Subunit vadose zone and a soil cover as the RA for the A-Area Ash Pile (788-2A).

Characterization indicated the Trench Subunit contaminant plume is migrating laterally along a perched water table to a point where it has impacted the MAAZ (WSRC 2005a). The path of migration goes across the area of the Potential Pit. The Potential Pit was previously characterized and there are no problems warranting action for near-surface soils (WSRC 1997). The wells of the SVE system (interim and final RAs) established at the potential pit are treating deep, vadose-zone contamination migrating from the Trench Subunit.

Rebound testing was conducted on September 5, 2012, which indicated that the VOC removal at the ABRP Trench Subunit is mostly diffusion limited (SRNS 2018a).

Zone of Influence testing was performed on December 4, 2015, to provide data to increase efficiency of VOC removal in the vadose soils after 14 wells were disconnected from the soil vapor extraction unit (SVEU). As a result, MicroBlowers™ were modified (SRNS 2018a).

Configuration Changes

During the operational life of SVE at ABRP, many modifications to the system have been made to adjust to changing field conditions. These changes are listed in Table 1. For further details regarding construction of the SVE at ABRP, refer to the PCR (SRNS 2009a). Historical configuration changes to the SVE at ABRP are provided in more detail in the PERs.

2.1.3 Current Configuration

The ABRP RA operated only PSVE systems in 2018. The ASVE was permanently shut down in December 2017. The last three ASVE wells, ASH-06, AHT-08B and AHT-11A started operations as PSVE wells on October 17, 2018. See Section 4.1 for a discussion of the technical basis to remove the ASVE system from service. The current PSVE system uses 26 wells consisting of 13 wells equipped with MicroBlowers™ powered by photovoltaic units and 13 wells equipped with BaroBalls™. Construction details for the SVE wells are shown in Table 2. The well locations are shown in Figure 3 and are in the following subunits:

- ABRP Trench Subunit – Three wells (AHT-05, -06 and ASH-06). The ABRP Trench is 4.6-m (15-ft) wide by 91.4-m (300-ft) long and between 2.4-m and 4.6-m (8- to 15-ft) deep, most of which is overlain by about 6.1 m (20 ft) of compacted ash.
- Ash Pile Subunit – Twelve wells (AHT-7A, -7B through AHT-12A, -12B) clustered in sets of two.
- Potential Pit Subunit – Ten single wells (ABV-01, ARV-1D1, -2D1, -2D2, and -2D3, and AHT-13 through AHT-17) along the northern, cleared edge in an east to west orientation.
- Rubble Pit Subunit – One well (ARV-3D3).

2.1.4 Sampling Methods and Results

ABRP TCE concentrations at the MicroBlowers™ and BaroBalls™ wells have decreased significantly during ASVE system operation. In 2007 prior to ASVE operation, MicroBlowers™ sample results averaged about 33 parts per million by volume (ppmV) and BaroBalls™ sample results averaged about 16 ppmV. In 2018, MicroBlower™ sample results averaged 0.26 ppmV and

BaroBall™ sample results averaged 0.01 ppmV. Only one BaroBall™ well (AHT-10B) had a detectable sample result (0.032 ppmV) in 2018.

Quarterly MicroBlowers™ well exhaust gas TCE results are listed in Table 3 and quarterly BaroBalls™ well exhaust gas TCE results are listed in Table 4. MicroBlowers™ and BaroBalls™ combined extracted 0.68 kilograms (kg [1.5 pound {lb}]) of TCE in 2018 (primarily from ASH-06 – 0.50 kg (1.1 lb) of TCE).

The VOC mass (PCE and TCE) removed from the SVE wells was estimated from the vapor-phase concentrations, flow rates and operational period. This method, like the method used in a study of SVE and air sparging (Holbrook et al. 1998), calculates mass removal by converting soil gas concentrations to mass removal rates using the extraction flow rate and the Ideal Gas Law. The generalized equation for mass removal is given in Equation 1.

$$M = C \times Q \times T \times MW \quad (\text{Equation 1})$$

where,

- M = cumulative mass removed (kg)
- C = vapor concentration (kg/m³)
- Q¹ = extraction flow rate (m³/hr)
- T² = operational period (hr)
- MW = molecular weight (grams/mole)

Notes:

¹ - MicroBlower™ extraction flow rates were measured monthly. However, BaroBall™ flow rates were estimated to be a uniform average of one cubic feet per minute based on the estimated flow rates at Met Lab PSVE wells (Ref.: WSRC 2000b)

² - An operational period of 12 hours/day for MicroBlowers™ and 24 hours/day for BaroBalls™ was used.

2.2 MCB Subunit

2.2.1 Treatment Area

The treatment area for the MCB Subunit was established by the IROD (WSRC 1999) based on the soil RG of 344 µg/kg for TCE and PCE concentration contours and is shown in Figure 4. The areas were identified by extensive characterization and sampling history at the MCB Subunit since 1996. This sampling provided sufficient data to identify the location of ASVE in high VOC

concentration area (greater than 50 ppmV, defined for this OU as a hot spot area), the location of PSVE in lower concentration areas (less than 50 ppmV) and the SVE design requirements.

2.2.2 Historical Information

At MCB, the upper 9 to 11 m (30 to 35 ft) of the vadose zone consists of fine-grained sediments (the Upland Unit). Capillary forces within the sediments tend to restrict migration of contaminants. Characterization data at MCB showed that VOCs disposed of at the surface have migrated downward into the Upland Unit where further migration downward into the underlying sandy soils is limited.

The MCB ASVE system started operation on October 29, 2001, operated for approximately one year and then was removed from service after demonstrating that exhaust emissions were significantly below the target 50 ppmV. The active SVE wells were restored to passive operation with BaroBalls™ and are still in service.

The MCB SVE wells are screened in the sandy zone below the Upland Unit and have been able to remove VOC mass at a rate approximately equal to the downward migration rate from the Upland Unit, with some variation, as demonstrated by a diffusion rate study conducted by the Savannah River National Laboratory (WSRC 2005b) in 2004 and as evidenced by the relative stability in soil-gas concentration seen across the MCB Subunit.

2.2.3 Current Configuration

Since December 10, 2008, the MCB Subunit RA operates a network of 27 PSVE wells consisting of 25 wells equipped with BaroBalls™ and two wells, MCSV-07 and MCSV-17, equipped with MicroBlowers™. Locations of the wells are shown on Figure 4. Construction details of these wells are provided in Table 5. The PSVE system at MCB operates under the same principles and limitations discussed for PSVE operations at the Trench Subunit.

2.2.4 PSVE Results

Analytical results of sampling from MCB PSVE wells are provided in Tables 6 and 7. Soil-gas concentrations of TCE and PCE from wells MSCV-07 and MSCV-17 have declined significantly

after increasing significantly in years prior to conversion in December 2008. Sample results from both wells tend to be consistent, slightly above the lower lab detection limits, and both wells always have concentrations less than 5 ppmV since 2008. If either well shows three consecutive quarters of both PCE and TCE results that are less than detection limits (non-detect), they will be converted back to BaroBalls™.

Four wells (MCSV-07, -17, -25, -27) continue to produce TCE, but at low rates. From 2011 to 2018, the following average and maximum TCE concentrations were recorded:

- MCSV-07 had an average exhaust gas TCE concentration of 0.71 ppmV, with a high value of 1.153 ppmV in 2017. MCSV-07 remains stable in sampled exhaust gas concentrations.
- MCSV-17 had an average exhaust gas TCE concentration of 0.97 ppmV, with a high value of 1.734 ppmV in 2011. MCSV-17 remains stable in sampled exhaust gas concentrations.
- MCSV-25 had an average exhaust gas TCE concentration of 0.40 ppmV, with a high value of 1.228 ppmV in 2011. MCSV-25 remains stable in sampled exhaust gas concentrations.
- MCSV-27 had an average exhaust gas TCE concentration of 0.38 ppmV, with a high value of 1.122 ppmV in 2011. MCSV-27 remains stable and decreasing (last three samples were non-detects) in sampled exhaust gas concentrations.

If concentrations from the MCB BaroBalls™ wells (MCSV-25 and MCSV-27) indicate an upward trend for VOC concentrations, the wells will be converted to MicroBlowers™.

MicroBlowers™ and BaroBalls™ combined extracted ~0.68 kg (1.5 lb) of TCE in 2018. Wells near the dilute edge of the plume produce very little contaminant removal, as evidenced by sampling. Quarterly PCE and TCE well exhaust gas results for MicroBlowers™ and BaroBalls™ are listed in Table 6 and Tables 7, respectively.

3.0 CLOSURE CRITERIA FOR WASTE UNITS WITH SVE SYSTEMS

SRS is committed to SVE operations until the RGs are achieved. The closure criteria for determining when to terminate SVE operations is based on the attainment of the RGs/RAOs. The RAO will be met when residual TCE and PCE contamination in the vadose zone is reduced below

RGs in accordance with the action plan described in the ABRP/MCB/MBP OU CMI/RAIP (WSRC 2006). RGs/RAOs will be verified based on the measurement and evaluation of residual solvent contamination in soil media.

4.0 CONCLUSIONS/RECOMMENDATIONS

4.1 ABRP Trench Subunit Conclusion

Currently, the PSVE system consists of 13 wells equipped with MicroBlowers™/BaroBalls™ and 13 wells equipped with BaroBalls™. This system is functioning as expected.

After Core Team approval of the 2017 PER (SRNS 2018a), the transition to fully PSVE (described below) was completed when the last three remaining ASVE wells were converted to MicroBlowers™ operation in October 2018. The ABRP Trench SVEU had previously ended operations in December 2017. The technical basis for shutting down the SVEU is that the ASVE system had reached a point of diminishing returns as indicated by the following:

- Soil-gas vapor samples have tended to very low (near) asymptotic levels
- Energy expended in extraction of VOCs and equivalent carbon production is very high compared to the actual amount of VOCs extracted (SRNS 2018b).
- The soil formation is considered “diffusion limited” and energy intensive ASVE methods are not as efficient as PSVE for this condition.

The ASVE system initially removed 36.89 kg (81.32 lb) of TCE during the second half of 2008. Since then, removal continually diminished to only 0.20 kg (0.43 lb) of TCE in its last period of operation, the second half of 2017. These emissions rates from the SVEU were well below the permit limits contained in the Title V Air Permit (SCDHEC 2007). At these levels, PSVE removal of TCE is much more efficient than the energy intensive ASVE method.

Compliance sampling was discontinued after shutdown of the active SVEU in December 2017. An internal exemption from air permitting was obtained based on the Potential to Emit calculation that determined the ABRP PSVE (i.e., well sources fitted with MicroBlowers™ and BaroBalls™) is an Insignificant Activity. Emissions, including trace constituent emissions, will be reported, as

required, in the annual Air Emissions Inventory. Performance monitoring (Table 8) of the MicroBlowers™ and BaroBalls™ will continue until RGs are achieved.

4.2 MCB Subunit Conclusion

Currently, the PSVE system consists of 2 wells equipped with MicroBlowers™/BaroBalls™ and 24 wells equipped with BaroBalls™. The system continues to perform well and remains a cost-effective treatment technology in removing low concentration VOC contaminants.

Extensive characterization and sampling history have been documented for the MCB Subunit since 1996. MCB PSVE wells will continue to be monitored closely to watch for any upward trends in concentrations; concentrations are expected to continue to decrease with source depletion. However, if upward trending is conclusively identified at any well, MicroBlowers™ will be installed to ensure protection of underlying groundwater. For example, during 2006 through 2008, an increase was seen at wells MCSV-07 and MCSV-17. Subsequently, MicroBlowers™ were installed on these wells. MCSV-07 and/or MCSV-17 will be converted back to BaroBalls™ if three consecutive quarterly results are less than detection limits.

Declining exhaust concentrations indicate contaminant mass is being removed as it diffuses downward from the Upland Unit, depleting the VOC source. An increase in soil-gas concentration would indicate that VOC mass is migrating downward from the fine-grained Upland Unit at a faster rate than it is being removed by PSVE. The continued reduction in concentrations of TCE being emitted from the PSVE system are indicative that overall soil-gas concentrations in the permeable sands under the Upland Unit continue to decline over time. Therefore, more mass is being removed than is diffusing down from the Upland Unit which is protective of underlying groundwater.

4.3 Overall Recommendations

The PSVE unit operation and well sampling at the ABRP Trench Subunit and the MCB Subunit will continue until the RGs are achieved as stated in the ROD (WSRC 2007). Now that soil-gas vapor samples have reached a very low (near) asymptotic levels similar to other OU remedial actions with PSVE systems only, ABRP and MCB PSVE monitoring frequency is recommended

to be decreased to annually. Reporting frequency is recommended to be decreased to every five years and, instead of an annual PER submittal, be reported in the Five-Year Remedy Review Report for consistency with other similar OUs (e.g., D-Area Operable Unit, M-Area Operable Unit). The next Five-Year Remedy Review Report of ABRP/MCB/MBP OU has a revision 0 scheduled for a December 2022 submittal.

When vapor gas sampling indicates VOCs are no longer being removed or concentrations indicate VOCs are nearly depleted, confirmation soil sampling will be performed per a Core Team approved sampling plan to verify RGs have been met. If the confirmation soil sampling indicates RGs are met, PSVE will be shutdown. Otherwise, PSVE will continue.

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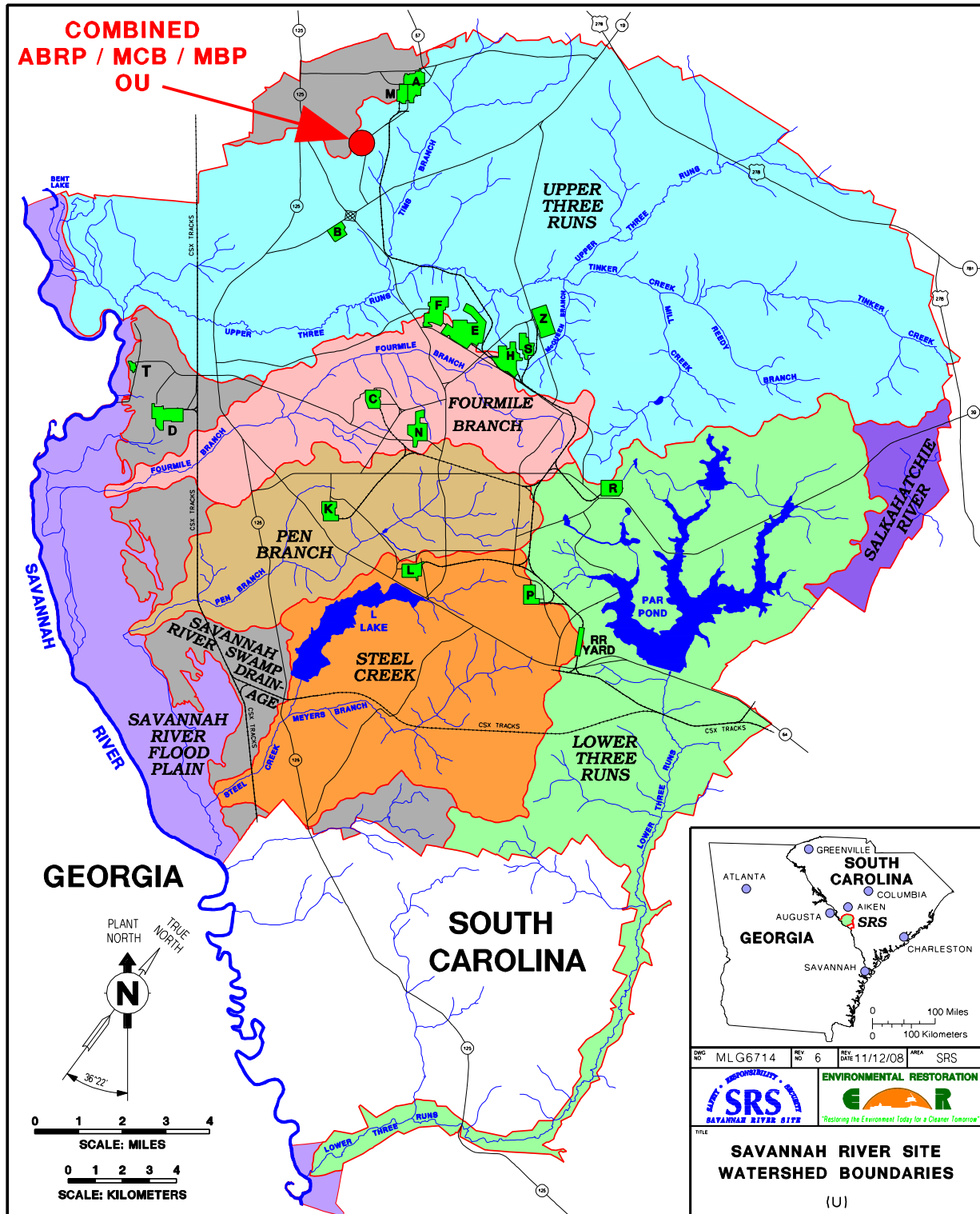


Figure 1. Location of the ABRP/MCB/MBP OU at Savannah River Site

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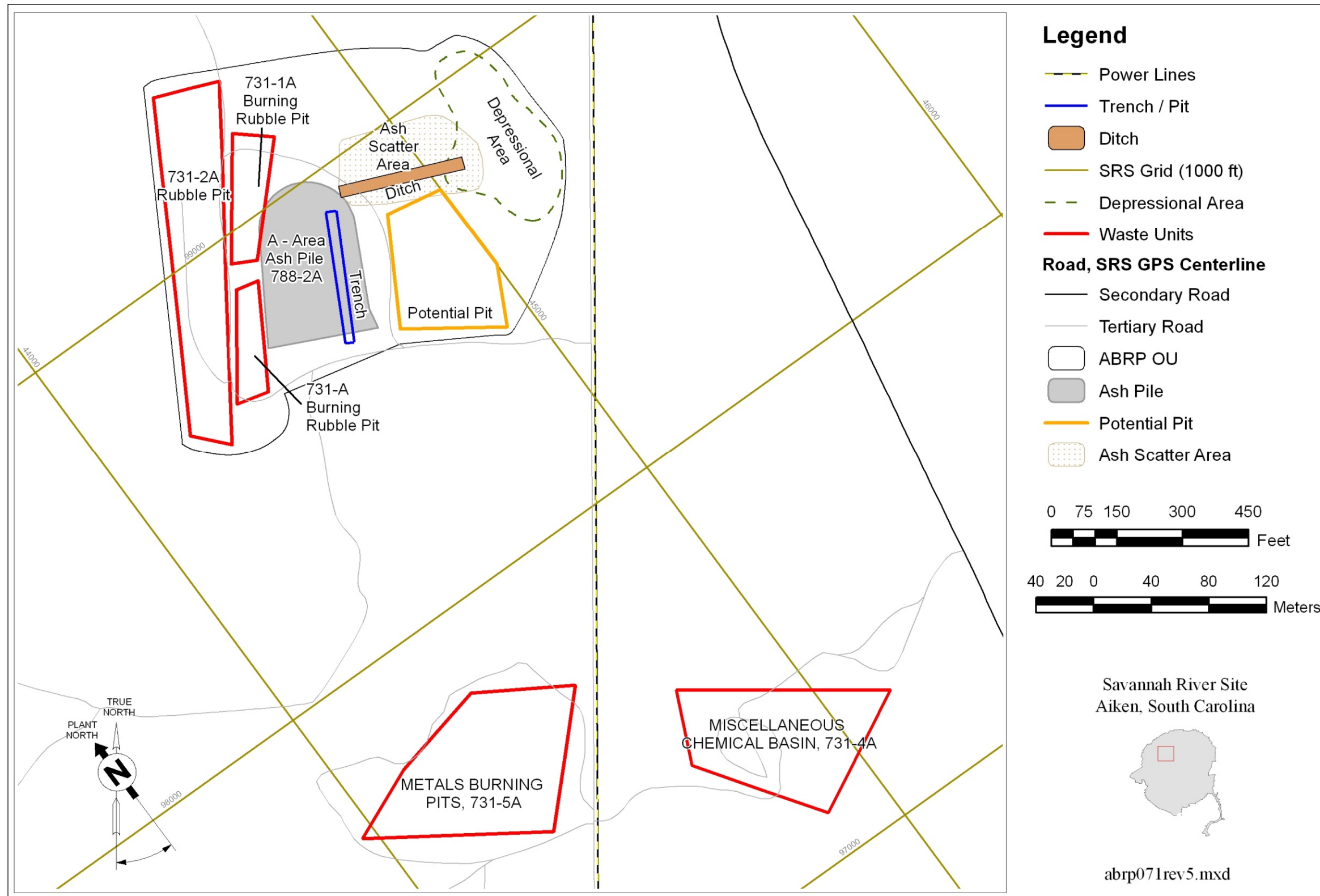


Figure 2. ABRP/MCB/MBP OU Subunits at Savannah River Site

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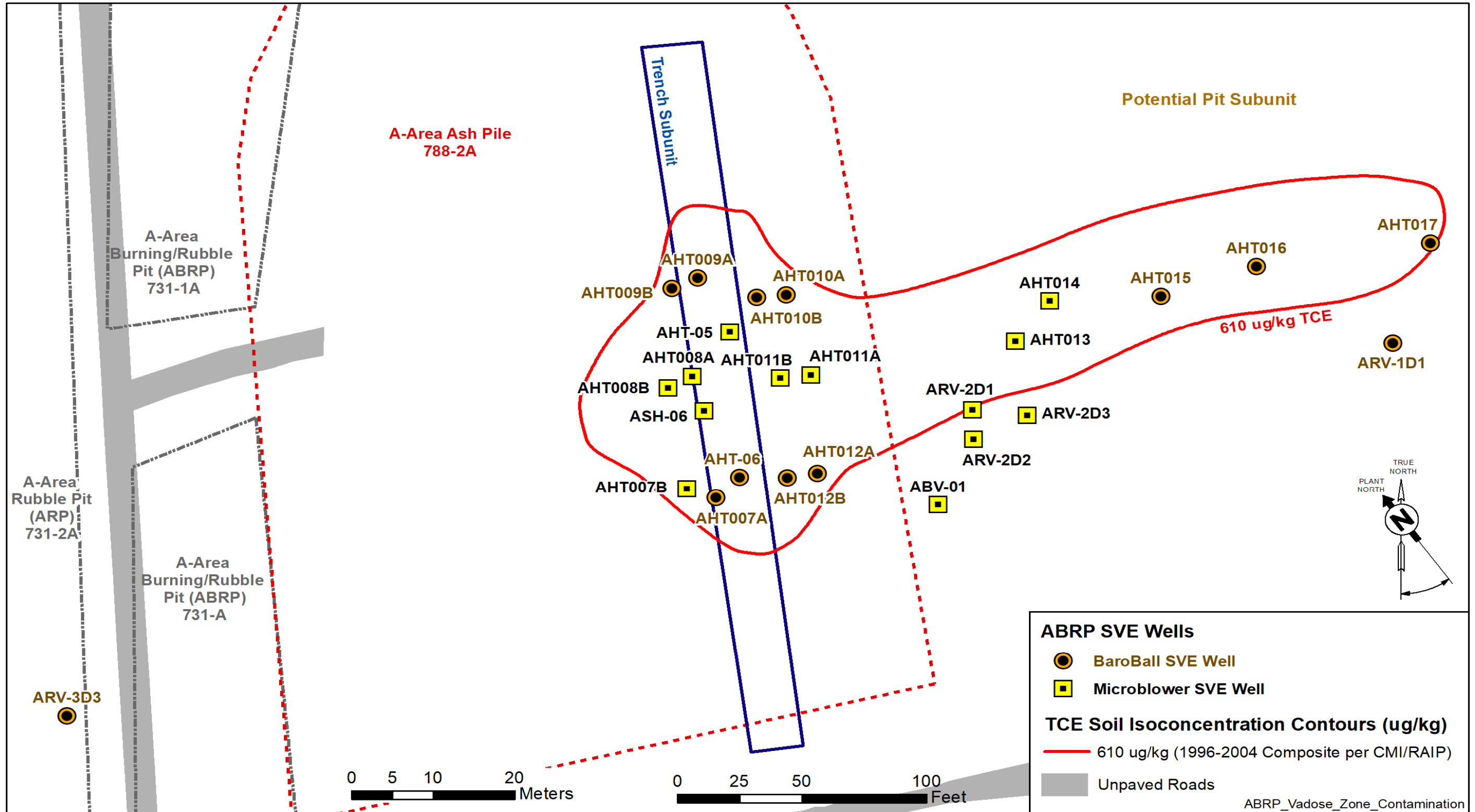


Figure 3. ABRP Vadose Zone Well Configuration and Treatment Area

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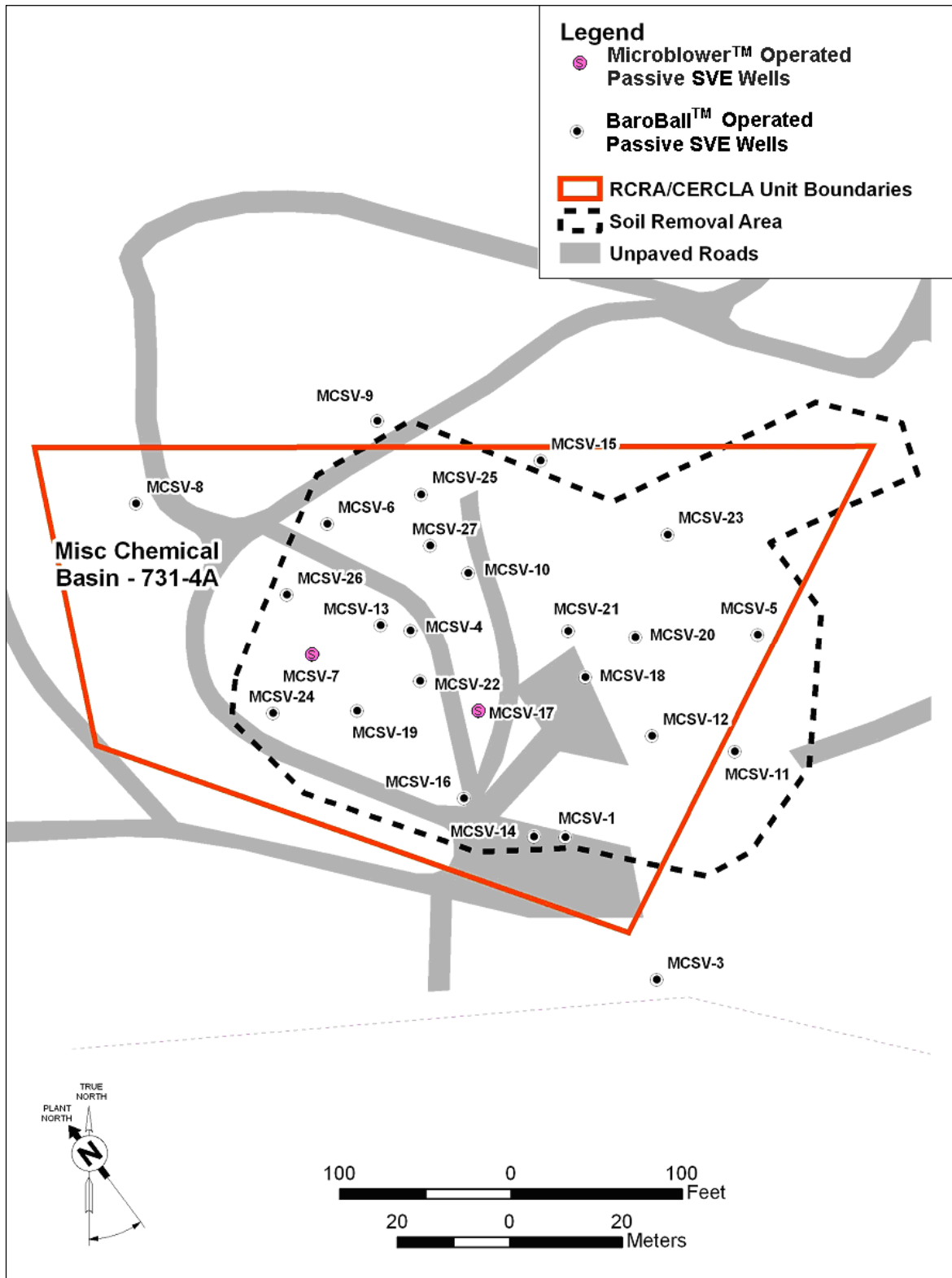


Figure 4. Miscellaneous Chemical Basin SVE Wells

Table 1. Historical ABRP SVE Operating Configurations

Interim Remedial Action (WSRC 2000a)		
Originally, 9 Wells Fitted with BaroBalls™		
ABV-01, AHT-05, AHT-06, ARV-1D1, ARV-2D1, -2D2, -2D3, -3D3, ASH-06		
Start Date	End Date	Technology
10/5/2001	12/3/2001	PSVE w/ BaroBalls™
12/3/2001	12/17/2001	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) connected to ASVE
12/17/2001	9/1/2002	All 9 wells PSVE w/ BaroBalls™
Explanation of Significant Differences (WSRC 2001)		
Operate 4 SVE Wells in the Trench/Pit Area		
(ABV-01, AHT-05, AHT-06, ASH-06)		
Start Date	End Date	Technology
9/1/2002	7/15/2003	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) converted to MicroBlowers™
7/15/2003	9/16/2003	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) connected to SVEU
9/16/2003	12/18/2003	4 wells (ABV-01, AHT-05, AHT-06, ASH-06) capped for rebound test
12/18/2003	Current	3 wells (ABV-01, AHT-05, ASH-06) converted to MicroBlowers™
12/18/2003	11/28/2007	1 well (AHT-06) converted to BaroBalls™
11/28/2007	8/7/2008	Operation Suspended
Final Remedial Action (WSRC 2007)		
17 Wells Added and Connected to SVEU		
AHT-07A, -07B, -08A, -08B, -09A, -09B, -10A, -10B, -11A, -11B, -12A, -12B, -13, -14, -15, -16, -17		
Start Date	End Date	Technology
06/23/2008	12/13/2018	ASVE
8/7/2008	Current	2 wells (ARV-2D1, -2D3) converted to MicroBlowers™, Operations Intermittent
10/01/2009	Current	1 well (ARV-2D2) converted to MicroBlowers™, Operations Intermittent
11/17/2015	Current	10 wells (AHT-07A, -09A, -09B, -10A, -10B, -12A, -12B, -15, -16, -17) converted to BaroBalls™
12/7/2015	Current	5 wells (AHT-07B, -08A, -11B, 13, -14) converted to MicroBlowers™
4/4/2013	12/13/2018	1 well (ASH-06) added to SVEU
	12/13/2018	3 wells (AHT-08B, -11A, ASH-06) shutdown
10/17/2018	Current	3 wells (AHT-08B, -11A, ASH-06) converted to MicroBlowers™
Current Configuration - 13 MicroBlowers™, 13 BaroBalls™		

Table 2. ABRP Well Construction Details

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	(ft bgs)		(ft)
<i>Installed for Final RA in 2008</i>						
AHT-7A	431,024.385	3,686,483.710	357.04	82.2	102.2	20
AHT-7B	431,020.836	3,686,484.858	357.43	45.7	70.7	25
AHT-8A	431,021.492	3,686,499.696	357.42	82.8	102.8	20
AHT-8B	431,018.533	3,686,498.220	357.69	45.4	70.4	25
AHT-9A	431,022.143	3,686,512.833	357.29	82.6	102.6	20
AHT-9B	431,019.003	3,686,511.452	357.52	46.0	71.0	25
AHT-10A	431,033.003	3,686,510.600	355.79	81.0	121.0	40
AHT10B	431,029.389	3,686,510.231	356.16	30.4	70.4	40
AHT-11A	431,036.050	3,686,499.890	355.39	80.4	120.4	40
AHT-11B	431,032.284	3,686,499.523	356.04	30.6	70.6	40
AHT-12A	431,036.846	3,686,486.939	355.81	80.4	120.4	40
AHT-12B	431,033.168	3,686,486.297	356.06	30.4	70.4	40
AHT-13	431,061.061	3,686,504.415	340.63	79.9	109.9	30
AHT-14	431,065.313	3,686,509.809	340.19	80.1	115.1	35
AHT-15	431,078.882	3,686,510.377	338.72	74.7	119.7	45
AHT-16	431,090.604	3,686,514.312	337.64	80.0	120.0	
AHT-17	431,111.851	3,686,517.379	335.95	95.0	120.0	
<i>Installed for Interim RA in 2003</i>						
ABV-01	431,051.581	3,686,482.763	340.7	73	123	50
ASH-06	431,022.923	3,686,495.167	360.7	40	140	100
AHT-05 – upper screen	431,026.137	3,686,505.643	359.3	50	70	20
– middle screen				90	100	10
– lower screen				120	140	20
AHT-06 – upper screen	431,027.323	3,686,486.373	361.2	45	80	35
– middle screen				95	105	10
– lower screen				120	125	5
<i>Installed for Sparging System in 2001</i>						
ARV-1D1	431,107.28	3,686,504.15	337.99	97.05	117.12	20.07
ARV-1D2	431,106.85	3,686,499.89	337.96	96.60	116.50	19.90
ARV-1D3	431,112.66	3,686,503.08	337.44	93.70	133.80	40.10
ARV-2D1	431,055.82	3,686,495.32	340.79	97.00	107.12	10.12
ARV-2D2	431,055.97	3,686,491.45	340.66	97.00	117.08	20.08
ARV-2D3	431,062.53	3,686,494.61	340.25	106.96	117.00	10.04
ARV-3D1	430,948.38	3,686,457.29	350.44	100.88	121.00	20.12
ARV-3D2	430,947.90	3,686,453.26	350.49	101.00	111.11	10.11
ARV-3D3	430,944.96	3,686,454.78	350.72	105.00	115.06	10.06

Table 2. ABRP Well Construction Details (Continued/End)

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	(ft bgs)		(ft)
<i>Installed for Sparging System in 2001</i>						
ARV-4D1	430,946.09	3,686,501.62	350.00	106.75	126.87	20.12
ARV-4D2	430,946.22	3,686,497.46	349.94	115.24	125.29	10.05
ARV-4D3	430,943.01	3,686,498.91	350.28	115.00	125.04	10.04
ARV-5D1	430,943.05	3,686,557.91	349.35	110.00	130.08	20.08
ARV-5D2	430,944.24	3,686,553.81	349.18	110.00	130.12	20.12
ARV-5D3	430,940.69	3,686,554.81	349.61	113.50	143.68	30.18
ARV-6D1	430,946.95	3,686,483.83	350.18	110.00	130.14	20.14
ARV-6D2	430,946.75	3,686,479.48	350.25	110.25	130.39	20.14
ARV-6D3	430,943.31	3,686,482.38	350.33	106.00	126.18	20.18
ARV-7D1	430,944.63	3,686,533.01	349.62	107.00	117.12	10.12
ARV-7D2	430,943.83	3,686,528.32	349.91	115.45	125.60	10.15
ARV-7D3	430,941.18	3,686,530.50	350.07	115.00	125.05	10.05
ARV-8D1	430,903.32	3,686,462.86	350.65	108.00	128.10	20.10
ARV-8D2	430,902.72	3,686,461.02	350.66	112.00	132.13	20.13
ARV-8D3	430,896.44	3,686,463.66	350.35	114.50	144.70	30.20
ARV-9D1	430,901.07	3,686,492.47	349.71	112.00	132.12	20.12
ARV-9D2	430,901.09	3,686,496.75	349.45	112.00	132.14	20.14
ARV-9D3	430,893.65	3,686,493.31	350.29	112.00	132.12	20.12
ARV-10D1	430,896.57	3,686,530.10	348.64	107.00	127.12	20.12
ARV-10D2	430,896.27	3,686,534.61	348.64	107.00	127.12	20.12
ARV-10D3	430,889.35	3,686,530.87	349.54	106.59	126.71	20.12

asl - above sea level

bgs - below ground surface

ft - feet

ABV - A-Area Burning/Rubble Pit Vadose Zone

AHT - A-Area Hidden Trench

ARV - A-Area Recovery Vapor

UTM - Universal Transverse Mercator

Table 3. ABRP MicroBlowers™ Well Exhaust Gas TCE Results (ppmV)


Collection Date	Station ID					
	ABV-01	AHT-05	ARV-2D1	ARV-2D2	ARV-2D3	ASH-06
Well History Notes	1	1	3	4	3	1, 5, 7
10/17/2005	30.000	27.900	*	*	*	87.330
1/4/2006	29.987	29.929	*	*	*	97.494
4/17/2006	29.974	31.957	*	*	*	107.659
8/28/2006	27.702	32.292	*	*	*	58.957
10/12/2006	26.104	30.227	*	*	*	36.869
1/17/2007	27.302	31.093	*	*	*	46.688
4/19/2007	28.500	34.503	*	*	*	71.700
7/18/2007	25.015	15.046	*	*	*	39.847
10/23/2007	27.683	21.676	*	*	*	26.609
9/23/2008	0.057	0.023	0.068	*	0.134	0.016
11/17/2008	0.007	0.031	0.021	*	0.076	ND
1/27/2009	0.045	0.226	0.014	*	ND	ND
4/21/2009	ND	ND	ND	*	ND	ND
7/16/2009	ND	0.119	ND	*	ND	ND
10/26/2009	ND	ND	ND	ND	ND	ND
1/19/2010	ND	ND	ND	ND	ND	ND
7/19/2010	ND	ND	ND	ND	ND	8.640
1/18/2011	ND	ND	ND	ND	ND	ND
4/18/2011	ND	ND	ND	ND	ND	10.218
7/12/2011	ND	ND	ND	ND	ND	43.769
10/19/2011	ND	ND	ND	ND	ND	14.838
1/24/2012	ND	ND	ND	ND	ND	9.195
4/23/2012	ND	ND	ND	ND	ND	38.244
7/16/2012	ND	ND	ND	ND	ND	57.557
10/16/2012	ND	ND	ND	ND	ND	27.504
1/14/2013	ND	ND	ND	ND	ND	14.900
4/15/2013	ND	ND	ND	ND	ND	3.290
7/17/2013	ND	ND	ND	ND	ND	**
11/19/2013	ND	ND	ND	ND	ND	**
2/19/2014	ND	ND	ND	ND	ND	**
4/22/2014	ND	ND	ND	ND	ND	**
8/12/2014	ND	ND	ND	ND	ND	**
10/14/2014	ND	ND	ND	ND	ND	**
2/9/2015	ND	ND	ND	ND	ND	**
4/28/2015	ND	ND	ND	ND	ND	**
7/21/2015	ND	0.104	ND	ND	ND	**
12/8/2015	ND	ND	ND	ND	ND	**
2/8/2016	ND	ND	ND	ND	ND	**
5/17/2016	ND	ND	ND	0.049	ND	**
9/13/2016	ND	ND	ND	ND	ND	**
12/12/2016	ND	ND	ND	0.068	ND	**
2/13/2017	0.036	ND	ND	0.034	ND	**
5/16/2017	ND	ND	ND	ND	ND	**
9/14/2017	ND	ND	ND	ND	ND	**
12/13/2017	ND	ND	ND	0.033	ND	**
2/12/2018	ND	ND	ND	ND	0.033	ND
5/14/2018	0.033	0.089	0.046	0.078	0.295	ND
9/18/2018	ND	0.078	ND	0.045	ND	3.383
12/17/2018	0.028	ND	ND	0.042	0.038	0.429

Table 3. ABRP MicroBlowers™ Well Exhaust Gas TCE Results (ppmV)
 (Continued/End)

Collection Date	Station ID						
	AHT-07B	AHT-08A	AHT-08B	AHT-11A	AHT-11B	AHT-13	AHT-14
Well History Notes	2, 6	2, 6	2, 7	2, 7	2, 6	2, 6	2, 6
2/8/2016	ND	ND	**	**	ND	ND	ND
5/17/2016	ND	ND	**	**	ND	ND	ND
9/13/2016	ND	ND	**	**	ND	ND	ND
12/12/2016	ND	ND	**	**	ND	ND	ND
2/13/2017	ND	ND	**	**	ND	ND	ND
5/16/2017	ND	ND	**	**	ND	ND	ND
9/14/2017	ND	ND	**	**	ND	ND	ND
12/13/2017	ND	ND	**	**	ND	ND	ND
2/12/2018	0.082	ND	ND	ND	0.038	ND	ND
5/14/2018	0.156	ND	ND	ND	0.044	0.036	ND
9/18/2018	0.139	ND	0.027	ND	ND	ND	ND
12/17/2018	0.171	ND	0.273	ND	ND	ND	ND

Well History Notes:

- ¹ ABV-01, AHT-05 and ASH-06 were converted to a MicroBlowers™ SVE well on 9/1/2002
- ² AHT-07B, -08A, -08B, -11A, -11B, -13, -14 were installed in April 2008
- ³ ARV-2D1 and ARV-2D3 was converted to a MicroBlowers™ SVE well in 8/7/2008
- ⁴ ARV-2D2 was converted to a MicroBlowers™ SVE well in Q3, 2009
- ⁵ ASH-06 was converted to ASVE in April 2013
- ⁶ AHT-07B, -08A, -11B, -13, -14 were converted to a MicroBlowers™ SVE well on 12/7/15
- ⁷ AHT-08B, -11A and ASH-06 were converted to a MicroBlowers™ SVE well on 10/17/18

 –Connected to MicroBlower™.

*Connected to BaroBalls™.

**Connected to ASVE

Acronyms:

- ABV – A-Area Burning/Rubble Pit Vadose Zone
- AHT – A-Area Hidden Trench
- ARV – A-Area Recovery Vapor
- ASH – A-Area Ash Pile
- ND – non-detect
- ppmV – parts per million by volume

Table 4. ABRP PSVE BaroBalls™ Well Exhaust Gas TCE Results (ppmV)

Collection Date	Station ID						
	AHT-06	ARV-1D1	ARV-2D2	ARV-3D3	AHT-07A	AHT-09A	AHT-09B
Well History Notes	2	1	1, 3	1	6, 7	6, 7	6, 7
10/17/2005	ND	1.550	79.500	1.050			
1/4/2006	ND	1.445	75.073	1.689			
4/17/2006	14.308	1.590	88.868	2.565			
8/28/2006	44.583	1.358	56.672	3.125			
10/12/2006	5.310	0.955	51.060	2.248			
1/17/2007	2.606	1.130	54.020	1.470			
4/19/2007	ND	0.623	45.571	0.995			
7/18/2007	1.079	0.620	43.143	0.553			
10/23/2007	0.057	0.703	40.715	0.876			
9/23/2008	1.079	0.020	0.132	ND			
11/17/2008	0.057	0.018	0.128	ND			
1/27/2009	0.097	0.006	0.659	ND			
4/21/2009	ND	ND	ND	ND			
7/16/2009	ND	ND	ND	ND			
10/26/2009	ND	ND	*	ND			
1/19/2010	ND	ND	*	ND			
7/19/2010	ND	ND	*	ND			
1/18/2011	ND	ND	*	ND			
4/18/2011	0.269	ND	*	ND			
7/12/2011	ND	ND	*	ND			
10/19/2011	ND	ND	*	ND			
1/24/2012	0.745	ND	*	ND			
4/23/2012	0.140	ND	*	ND			
7/16/2012	ND	ND	*	ND			
10/16/2012	0.202	ND	*	ND			
1/14/2013	ND	ND	*	ND			
4/15/2013	ND	ND	*	ND			
7/17/2013	ND	ND	*	ND			
11/19/2013	ND	ND	*	ND			
2/19/2014	ND	ND	*	ND			
4/22/2014	ND	ND	*	ND			
8/12/2014	ND	ND	*	ND			
10/14/2014	ND	ND	*	ND			
2/9/2015	ND	ND	*	ND			
4/28/2015	ND	ND	*	ND			
7/21/2015	ND	ND	*	ND			
12/8/2015	ND	ND	*	ND			
2/8/2016	ND	ND	*	ND	0.067	ND	0.031
5/17/2016	ND	ND	*	ND	0.054	ND	ND
9/13/2016	0.091	ND	*	ND	ND	ND	ND
12/12/2016	0.045	ND	*	ND	0.042	ND	ND
2/13/2017	0.132	ND	*	ND	ND	ND	ND
5/16/2017	0.041	ND	*	ND	ND	ND	ND
9/14/2017	ND	ND	*	ND	ND	ND	ND
12/13/2017	ND	ND	*	ND	ND	ND	ND
2/12/2018	ND	ND	*	ND	ND	ND	ND
5/14/2018	ND	ND	*	ND	ND	ND	ND
9/18/2018	ND	ND	*	ND	ND	ND	ND
12/17/2018	ND	ND	*	ND	ND	ND	ND

Table 4. ABRP PSVE BaroBalls™ Well Exhaust Gas TCE Results (ppmV)
 (Continued/End)

Collection Date	Station ID						
	AHT-10A	AHT-10B	AHT-12A	AHT-12B	AHT-15	AHT-16	AHT-17
Well History Notes	6, 7	6, 7	6, 7	6, 7	6, 7	6, 7	6, 7
2/8/2016	0.067	0.045	ND	ND	ND	ND	ND
5/17/2016	ND	ND	ND	ND	ND	ND	ND
9/13/2016	ND	ND	ND	ND	ND	ND	ND
12/12/2016	0.032	ND	ND	ND	ND	ND	ND
2/13/2017	ND	ND	ND	ND	ND	ND	ND
5/16/2017	ND	ND	ND	ND	ND	ND	ND
9/14/2017	ND	ND	ND	ND	ND	ND	ND
12/13/2017	ND	ND	ND	ND	ND	ND	ND
2/12/2018	ND	0.032	ND	ND	ND	ND	ND
5/14/2018	ND	ND	ND	ND	ND	ND	ND
9/18/2018	ND	ND	ND	ND	ND	ND	ND
12/17/2018	ND	ND	ND	ND	ND	ND	ND

Well History Notes:

¹ ARV-1D1, -2D2, -3D3 was converted to a BaroBall™ SVE well in 10/5/2001.

² AHT-06, ASH-06 was converted to a BaroBall™ SVE well in 12/18/2003.

³ ARV-2D2 was converted to a MicroBlower™ SVE well in Q3, 2009

⁴ ASH-06 was converted to a ASVE well on 4/4/13

⁵ AHT-07A, -09A, -09B, -10A, -10B, -12A, -12B, -15, -16, -17 were installed in April 2008

⁶ AHT-07A, -09A, -09B, -10A, -10B, -12A, -12B, -15, -16, -17 were converted to BaroBalls on 11/17/2015

* –Connected to MicroBlower™.

*Connected to ASVE

Acronyms:

ABV – A-Area Burning/Rubble Pit Vadose Zone

AHT – A-Area Hidden Trench

ARV – A-Area Recovery Vapor

ASH – A-Area Ash Pile

ND – non-detect

ppmV – parts per million by volume

Table 5. MCB SVE Well Construction Details

Well ID	East Coordinate (UTM)	North Coordinate (UTM)	Ground Surface	Screen Top	Screen Bottom	Screen Length
			(ft asl)	(ft bgs)		(ft)
MCSV-1	431,353.543	3,686,134.387	336.11	unknown		
MCSV-3	431,369.808	3,686,108.869	331.169	80	95	15
MCSV-3A				57	72	15
MCSV-4 – upper screen	431,326.036	3,686,171.426	337.083	15	30	15
MCSV-4 – intermediate screen				35	40	5
MCSV-4 – intermediate screen				45	50	5
MCSV-4 – intermediate screen				55	60	5
MCSV-4 – intermediate screen				65	70	5
MCSV-4 – lower screen				75	80	5
MCSV-5	431,387.721	3,686,170.675	330.978	60	90	30
MCSV-6 – upper screen	431,311.184	3,686,190.540	338.85	15	25	10
MCSV-6 – intermediate screen				30	35	5
MCSV-6 – intermediate screen				40	45	5
MCSV-6 – intermediate screen				50	55	5
MCSV-6 – intermediate screen				60	65	5
MCSV-6 – lower screen				70	80	10
MCSV-7 – upper screen	431,308.585	3,686,167.041	338.62	15	50	35
MCSV-7 – lower screen				75	80	5
MCSV-8	431,277.191	3,686,194.175	339.887	51	81	30
MCSV-9	431,320.147	3,686,209.038	337.55	50	80	30
MCSV-10	431,336.278	3,686,181.809	336.564	15	55	40
MCSV-11	431,383.657	3,686,149.697	330.341	55	85	30
MCSV-12	431,368.997	3,686,152.466	332.922	55	85	30
MCSV-13	431,320.744	3,686,172.337	338.071	20	50	30
MCSV-14	431,347.959	3,686,134.427	336.498	68	88	20
MCSV-15 – upper screen	431,349.123	3,686,201.887	334.411	50	70	20
MCSV-15 – lower screen				80	100	20
MCSV-16	431,335.487	3,686,141.283	336.761	40	70	30
MCSV-17 – upper screen	431,338.008	3,686,157.116	336.821	15	50	35
MCSV-17 – lower screen				75	80	5
MCSV-18	431,357.083	3,686,162.966	334.199	55	70	15
MCSV-19 – upper screen	431,316.481	3,686,156.959	337.746	15	50	35
MCSV-19 – lower screen				75	80	5
MCSV-20	431,365.996	3,686,170.283	333.381	55	70	15
MCSV-21	431,354.048	3,686,171.351	334.523	55	70	15
MCSV-22	431,327.679	3,686,162.193	337.088	20	70	50
MCSV-23	431,371.738	3,686,188.657	332.497	55	75	20
MCSV-24	431,301.588	3,686,156.502	339.139	60	90	30
MCSV-25 – upper screen	431,327.922	3,686,195.857	337.024	55	70	15
MCSV-25 – lower screen				80	95	15
MCSV-26 – upper screen	431,304.040	3,686,177.862	339.546	30	35	5
MCSV-27	431,329.482	3,686,186.662	336.89	64	99	35

Table 6. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas PCE Results

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)							
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09
1/27/09	0.008	0.024	0.348	ND	0.039	6.370	0.007	nr
4/21/09	0.014	ND	0.380	0.041	0.536	0.720	0.003	0.036
7/16/09	0.003	0.003	nr	0.016	0.015	2.506	0.007	0.006
10/28/09	ND	ND	0.082	ND	ND	0.116	ND	ND
1/19/10	ND	ND	ND	ND	ND	0.785	ND	ND
4/19/10	ND	ND	ND	ND	ND	0.429	ND	ND
7/19/10	ND	ND	ND	ND	ND	1.432	ND	ND
10/19/10	ND	ND	ND	ND	ND	1.065	ND	ND
1/18/11	ND	ND	ND	ND	ND	0.576	ND	ND
4/18/11	ND	ND	ND	ND	ND	0.558	ND	ND
7/12/11	ND	ND	ND	ND	ND	0.421	ND	ND
10/19/11	ND	ND	ND	ND	ND	0.861	ND	ND
1/24/12	ND	ND	ND	ND	ND	ND	ND	ND
4/23/12	ND	ND	ND	ND	ND	0.740	ND	ND
7/16/12	ND	ND	ND	ND	ND	0.605	ND	ND
10/16/12	ND	ND	ND	ND	ND	0.693	ND	ND
1/14/13	ND	ND	ND	ND	ND	0.887	ND	ND
4/15/13	ND	ND	ND	ND	ND	0.704	ND	ND
7/17/13	ND	ND	ND	ND	ND	0.562	ND	ND
11/18/13	ND	ND	ND	ND	ND	1.320	ND	ND
2/19/14	ND	ND	ND	ND	ND	0.382	ND	ND
4/22/14	ND	ND	ND	ND	ND	0.543	ND	ND
8/12/14	ND	ND	ND	ND	ND	1.001	ND	ND
10/14/14	ND	ND	ND	ND	ND	0.957	ND	ND
2/9/15	ND	ND	ND	ND	ND	0.888	ND	ND
4/28/15	ND	ND	ND	ND	ND	0.558	ND	ND
7/21/15	ND	ND	ND	ND	ND	0.828	ND	ND
12/8/15	ND	ND	ND	ND	ND	0.787	ND	ND
2/8/16	ND	ND	ND	ND	ND	1.083	ND	ND
5/17/16	ND	ND	ND	ND	ND	0.068	ND	ND
9/13/16	ND	ND	ND	ND	ND	1.393	ND	ND
12/14/16	ND	ND	ND	ND	ND	0.285	ND	ND
2/14/17	ND	ND	ND	ND	ND	1.492	ND	ND
5/16/17	ND	ND	ND	ND	ND	ND	ND	ND
9/14/17	ND	ND	ND	ND	ND	ND	ND	ND
12/13/17	ND	ND	ND	ND	ND	ND	ND	ND
2/13/18	ND	ND	ND	ND	ND	ND	ND	ND
5/15/18	ND	ND	ND	ND	ND	ND	ND	ND
9/17/18	ND	ND	ND	ND	ND	0.378	ND	ND
12/15/18	ND	ND	ND	ND	ND	ND	ND	ND

Table 6. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas PCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-10	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18
1/27/09	nr	0.011	ND	nr	ND	0.002	ND	0.069	ND
4/21/09	0.024	ND	0.004	0.033	ND	ND	ND	0.046	0.008
7/16/09	ND	0.007	0.006	ND	ND	ND	ND	0.050	ND
10/28/09	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/18/11	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/18/11	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/12/11	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/19/11	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/24/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/23/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/16/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/16/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/14/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/17/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/18/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/19/14	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/22/14	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/12/14	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/14/14	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/9/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/28/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/8/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/8/16	ND	ND	ND	0.086	ND	ND	ND	ND	ND
5/17/16	ND	ND	ND	ND	ND	ND	ND	0.030	ND
9/13/16	ND	ND	ND	ND	ND	ND	ND	0.033	ND
12/14/16	ND	ND	ND	ND	ND	ND	ND	0.033	ND
2/14/17	ND	ND	ND	0.065	ND	ND	ND	ND	ND
5/16/17	ND	ND	ND	ND	ND	ND	ND	0.035	ND
9/14/17	ND	ND	ND	ND	ND	ND	ND	0.031	ND
12/13/17	ND	ND	ND	ND	ND	ND	ND	0.031	ND
2/13/18	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/15/18	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/17/18	ND	ND	ND	ND	ND	ND	ND	0.435	ND
12/15/18	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 6. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas PCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-19	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
1/27/09	0.054	ND	0.007	0.004	0.012	0.004	nr	0.101	0.114
4/21/09	ND	0.031	0.017	0.056	0.005	ND	0.182	0.193	0.274
7/16/09	ND	ND	0.003	0.011	0.006	0.002	0.025	0.043	0.012
10/28/09	ND	ND	ND	ND	ND	ND	0.224	ND	0.129
1/19/10	ND	ND	ND	ND	ND	ND	0.101	ND	ND
4/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
10/19/10	ND	ND	ND	ND	ND	ND	ND	0.000	0.000
1/18/11	ND	ND	ND	ND	ND	ND	0.072	0.000	0.000
4/18/11	ND	ND	ND	ND	ND	ND	ND	0.000	0.000
7/12/11	ND	0.041	ND	ND	ND	ND	ND	0.000	0.000
10/19/11	ND	ND	ND	ND	0.087	ND	0.069	0.000	0.000
1/24/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/23/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/16/12	ND	ND	ND	ND	ND	ND	0.046	ND	0.044
10/16/12	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/14/13	ND	ND	ND	ND	ND	ND	0.050	ND	ND
4/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/17/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
11/18/13	ND	ND	0.031	ND	ND	ND	0.034	ND	ND
2/19/14	ND	ND	ND	ND	ND	ND	ND	ND	ND
4/22/14	ND	ND	ND	ND	ND	ND	0.038	ND	ND
8/12/14	ND	ND	ND	ND	ND	ND	0.043	ND	0.034
10/14/14	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/9/15	ND	ND	ND	ND	ND	ND	0.048	ND	ND
4/28/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/8/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/8/16	ND	0.032	0.031	ND	ND	ND	0.044	ND	0.030
5/17/16	ND	ND	0.030	ND	ND	ND	ND	ND	ND
9/13/16	ND	0.029	ND	ND	ND	ND	ND	ND	ND
12/14/16	ND	0.041	ND	ND	ND	ND	0.047	ND	ND
2/14/17	ND	ND	ND	ND	ND	ND	0.037	ND	ND
5/16/17	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/14/17	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/13/17	ND	ND	ND	ND	ND	ND	ND	ND	ND
2/13/18	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/15/18	ND	0.031	0.042	ND	ND	ND	0.061	ND	0.052
9/17/18	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/15/18	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 6. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas PCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)							
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09
2/24/04	0.007	0.000	0.570	0.014	0.070	1.294	0.004	0.015
3/16/04	nr	0.002	0.637	nr	0.043	0.843	nr	nr
3/31/04	0.004	0.037	0.941	0.008	0.038	0.091	nr	0.008
6/10/04	0.007	0.355	18.601	0.045	0.111	0.126	0.014	0.013
8/5/04	0.006	0.063	3.602	0.006	0.061	0.246	0.002	0.006
9/7/04	0.004	ND	nr	0.006	0.056	0.752	0.007	0.004
12/7/04	0.005	ND	2.539	0.010	0.212	1.016	0.002	0.007
1/5/05	0.006	ND	1.424	0.012	0.142	0.656	0.002	0.006
2/16/05	nr	ND	0.828	nr	nr	0.542	nr	nr
3/23/05	nr	0.000	1.493	nr	0.118	0.869	nr	nr
7/7/05	nr	0.004	2.050	nr	0.022	5.775	nr	nr
8/30/05	0.003	0.002	2.536	nr	NR	5.624	nr	nr
9/26/05	0.042	0.007	2.009	nr	0.037	6.469	nr	nr
10/6/05	0.024	0.000	2.909	nr	1.033	8.247	nr	nr
1/30/06	0.081	0.000	1.270	nr	0.040	4.308	nr	nr
5/2/06	ND	0.000	0.918	nr	0.010	7.550	nr	nr
6/26/06	nr	0.000	1.963	0.123	0.052	5.624	nr	nr
11/15/06	nr	0.000	0.677	0.018	0.025	5.893	nr	0.032
11/30/06	nr	0.000	0.018	0.107	0.115	0.018	nr	0.345
12/15/06	nr	0.000	0.904	0.035	0.052	3.992	nr	0.049
9/27/07	nr	0.000	nr	0.022	0.056	7.063	nr	0.044
4/18/08	ND	nr	0.040	0.010	ND	5.354	nr	0.020
6/26/08	nr	nr	0.018	0.020	0.002	5.524	0.016	0.016
9/22/08	0.013	0.014	0.596	0.026	0.040	0.195	0.003	0.019
11/17/08	0.004	0.013	0.226	0.026	0.009	5.995	0.008	0.010

Table 6. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas PCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-10	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18
2/24/04	0.050	0.020	0.023	4.158	0.003	0.006	nr	nr	0.016
3/16/04	0.043	nr	nr	9.980	nr	nr	nr	0.063	nr
3/31/04	0.034	0.015	0.011	5.704	0.002	0.004	nr	0.019	0.017
6/10/04	0.058	0.018	0.016	3.672	0.021	0.018	nr	0.032	nr
8/5/04	0.051	nr	0.012	11.154	0.002	0.003	0.026	nr	nr
9/7/04	0.040	0.010	0.009	6.459	0.020	0.010	nr	0.057	nr
12/7/04	0.044	0.014	0.013	3.565	nr	0.004	nr	0.025	nr
1/5/05	0.037	0.015	nr	9.207	0.002	0.004	nr	0.033	nr
2/16/05	0.040	nr	nr	1.112	nr	nr	nr	0.014	nr
3/23/05	nr	nr	nr	6.979	nr	nr	nr	0.025	nr
7/7/05	0.071	nr	nr	1.897	nr	nr	nr	0.031	nr
8/30/05	0.101	nr	nr	5.751	nr	nr	nr	NR	nr
9/26/05	0.122	nr	nr	1.568	nr	nr	nr	0.059	nr
10/6/05	0.164	0.591	nr	3.955	nr	nr	nr	0.724	nr
1/30/06	0.083	nr	nr	6.119	nr	nr	nr	0.068	nr
5/2/06	0.064	nr	nr	0.727	nr	nr	nr	0.055	nr
6/26/06	0.080	nr	0.032	3.292	nr	nr	nr	nr	nr
11/15/06	0.075	nr	0.014	1.818	0.010	0.009	0.009	0.064	nr
11/30/06	0.146	nr	0.031	0.001	1.055	0.997	0.579	5.368	nr
12/15/06	0.080	nr	0.016	2.815	0.017	0.011	0.019	0.105	nr
9/27/07	0.267	0.028	nr	0.060	0.010	0.013	0.022	0.160	0.024
4/18/08	0.000	ND	ND	0.058	ND	ND	0.000	0.180	0.043
6/26/08	0.049	0.002	0.011	0.341	0.003	0.008	0.007	0.157	ND
9/22/08	0.012	0.002	0.007	0.044	0.002	0.008	0.003	0.038	0.004
11/17/08	0.042	0.003	0.009	0.007	0.002	0.005	0.002	0.078	0.005

Table 6. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas PCE Results
 (Continued/End)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-19	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
2/24/04	0.051	0.053	0.060	0.048	0.007	0.011	0.110	0.073	nr
3/16/04	0.042	nr	nr	nr	nr	nr	0.081	0.051	0.311
3/31/04	0.045	0.040	0.043	0.050	0.005	0.008	0.062	0.043	nr
6/10/04	0.066	0.063	0.071	0.029	0.006	0.016	0.055	0.124	nr
8/5/04	0.162	0.038	0.042	0.058	0.006	0.008	0.053	0.090	0.014
9/7/04	0.064	0.039	0.037	0.062	0.004	0.006	nr	0.090	nr
12/7/04	0.112	0.052	0.036	0.262	0.007	0.012	0.030	0.142	0.265
1/5/05	0.064	0.034	0.037	0.088	0.005	0.009	0.040	0.084	0.183
2/16/05	0.030	nr	nr	0.037	nr	nr	0.016	0.094	0.138
3/23/05	0.090	nr	nr	0.051	nr	nr	nr	0.135	nr
7/7/05	0.119	nr	nr	0.113	nr	nr	0.056	0.196	0.026
8/30/05	0.193	nr	nr	0.157	nr	nr	0.096	0.176	0.208
9/26/05	0.212	nr	nr	0.254	nr	nr	0.080	0.286	0.337
10/6/05	0.789	nr	0.112	0.830	nr	nr	2.488	0.962	0.468
1/30/06	0.043	nr	0.065	0.154	nr	nr	0.087	0.384	0.489
5/2/06	0.033	nr	nr	0.063	nr	nr	0.042	0.241	0.081
6/26/06	0.077	nr	0.083	0.238	nr	nr	nr	0.330	0.013
11/15/06	0.048	0.053	0.047	0.085	0.011	0.019	0.055	0.328	0.067
11/30/06	0.111	0.381	1.910	0.197	0.185	0.165	0.183	0.108	0.037
12/15/06	0.074	0.053	0.063	0.152	0.011	0.014	0.073	0.337	0.004
9/27/07	0.085	nr	nr	0.158	0.014	0.020	0.504	nr	0.050
4/18/08	0.020	0.040	ND	0.010	0.000	nr	ND	ND	0.210
6/26/08	0.020	0.051	0.080	0.034	0.006	0.008	0.054	0.249	0.304
9/22/08	0.022	0.017	0.055	0.015	0.007	0.002	0.017	0.170	1.866
11/17/08	0.061	0.011	0.038	0.021	0.008	0.003	0.006	0.058	0.064



ND - Non-Detect
 MCSV - Miscellaneous Chemical Soil Vapor
 nr - no result
 - MicroBlower™
 - Capped for Rebound Testing

Table 7. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas TCE Results

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)							
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09
1/27/09	0.071	0.385	1.385	ND	0.054	4.904	0.009	nr
4/21/09	0.134	ND	1.088	0.356	0.627	0.737	ND	0.159
7/16/09	0.026	0.058	nr	0.086	0.026	2.104	0.009	0.033
10/28/09	ND	ND	0.584	ND	ND	ND	ND	ND
1/19/10	ND	0.139	0.289	ND	ND	0.793	ND	ND
4/19/10	ND	ND	ND	ND	ND	0.429	ND	ND
7/19/10	ND	ND	ND	ND	ND	1.160	ND	ND
10/19/10	ND	ND	ND	ND	ND	0.855	ND	0.187
1/18/11	ND	0.174	ND	ND	ND	0.442	ND	0.129
4/18/11	ND	ND	ND	ND	ND	0.430	ND	ND
7/12/11	ND	ND	ND	ND	ND	0.427	ND	ND
10/19/11	ND	ND	ND	0.145	ND	0.718	ND	ND
1/24/12	ND	ND	ND	ND	ND	ND	ND	ND
4/23/12	ND	ND	ND	ND	ND	0.962	ND	ND
7/16/12	ND	ND	ND	ND	ND	0.566	ND	0.193
10/16/12	ND	ND	ND	ND	ND	0.667	ND	ND
1/14/13	ND	0.111	ND	ND	ND	0.891	ND	ND
4/15/13	ND	ND	ND	ND	ND	0.739	ND	ND
7/17/13	ND	ND	ND	ND	ND	0.698	ND	ND
11/18/13	ND	0.122	ND	ND	ND	1.080	ND	ND
2/19/14	ND	0.130	ND	ND	ND	0.520	ND	ND
4/22/14	ND	0.134	ND	ND	ND	0.581	ND	ND
8/12/14	ND	ND	ND	ND	ND	0.780	ND	ND
10/14/14	ND	ND	ND	ND	ND	0.831	ND	ND
2/9/15	ND	ND	ND	0.099	ND	0.660	ND	ND
4/28/15	ND	ND	ND	ND	ND	0.533	ND	ND
7/21/15	ND	ND	ND	0.070	ND	0.829	ND	ND
12/8/15	ND	0.099	ND	0.123	ND	0.772	ND	0.103
2/8/16	ND	0.184	0.069	0.099	0.044	0.803	ND	0.142
5/17/16	ND	0.092	ND	ND	ND	0.081	ND	ND
9/13/16	ND	0.086	0.083	0.047	ND	1.002	ND	ND
12/14/16	ND	0.229	0.070	0.079	ND	0.192	ND	0.074
2/14/17	ND	0.260	0.057	0.075	ND	1.023	ND	0.094
5/16/17	ND	ND	0.029	ND	ND	1.153	ND	ND
9/14/17	ND	0.060	ND	ND	ND	1.047	ND	ND
12/13/17	ND	ND	0.057	ND	ND	1.130	ND	ND
2/13/18	ND	ND	ND	ND	ND	ND	ND	ND
5/15/18	ND	0.208	0.036	0.147	ND	ND	ND	0.092
9/17/18	ND	0.037	0.037	ND	ND	0.281	ND	ND
12/15/18	ND	ND	0.069	0.067	ND	ND	ND	0.054

Table 7. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas TCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-10	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18
1/27/09	nr	0.019	ND	nr	ND	0.015	0.022	3.196	0.022
4/21/09	0.119	ND	0.044	0.026	ND	0.010	0.013	1.205	0.073
7/16/09	ND	0.008	0.011	ND	ND	ND	ND	1.346	ND
10/28/09	ND	ND	ND	ND	ND	ND	ND	2.153	ND
1/19/10	ND	ND	ND	ND	ND	ND	ND	0.708	ND
4/19/10	ND	ND	ND	ND	ND	ND	ND	0.900	ND
7/19/10	ND	ND	ND	ND	ND	ND	ND	0.734	ND
10/19/10	ND	ND	ND	ND	ND	ND	ND	1.346	ND
1/18/11	ND	ND	ND	ND	ND	ND	ND	0.050	ND
4/18/11	ND	ND	ND	ND	ND	ND	ND	0.868	ND
7/12/11	ND	ND	ND	ND	ND	ND	ND	1.045	ND
10/19/11	ND	ND	ND	ND	ND	ND	ND	1.734	ND
1/24/12	ND	ND	ND	ND	ND	ND	ND	0.428	ND
4/23/12	ND	ND	ND	ND	ND	ND	ND	0.972	ND
7/16/12	ND	ND	ND	ND	ND	ND	ND	1.182	ND
10/16/12	ND	ND	ND	ND	ND	ND	ND	0.897	ND
1/14/13	ND	ND	ND	ND	ND	ND	ND	0.896	ND
4/15/13	ND	ND	ND	ND	ND	ND	ND	0.810	ND
7/17/13	ND	ND	ND	ND	ND	ND	ND	0.931	ND
11/18/13	ND	ND	ND	ND	ND	ND	ND	0.972	ND
2/19/14	ND	ND	ND	ND	ND	ND	ND	0.878	ND
4/22/14	ND	ND	ND	ND	ND	ND	ND	0.765	ND
8/12/14	ND	ND	ND	ND	ND	ND	ND	1.057	ND
10/14/14	ND	ND	ND	ND	ND	ND	ND	1.121	ND
2/9/15	ND	ND	ND	ND	ND	ND	ND	1.112	ND
4/28/15	ND	ND	ND	ND	ND	ND	ND	0.744	ND
7/21/15	ND	0.045	ND	ND	ND	ND	ND	1.018	ND
12/8/15	ND	ND	ND	ND	ND	ND	ND	0.983	0.029
2/8/16	ND	ND	ND	0.132	ND	ND	ND	1.125	0.028
5/17/16	ND	ND	ND	ND	ND	ND	ND	0.954	ND
9/13/16	ND	ND	ND	ND	ND	ND	ND	1.361	ND
12/14/16	ND	ND	ND	0.033	ND	ND	ND	0.993	ND
2/14/17	ND	ND	ND	0.119	ND	ND	ND	1.063	0.027
5/16/17	ND	ND	ND	ND	ND	ND	ND	0.987	ND
9/14/17	ND	ND	ND	ND	ND	ND	ND	1.180	ND
12/13/17	ND	ND	ND	ND	ND	ND	ND	1.057	ND
2/13/18	ND	ND	ND	ND	ND	ND	ND	0.050	ND
5/15/18	ND	ND	ND	ND	ND	ND	ND	ND	ND
9/17/18	ND	ND	ND	ND	ND	ND	ND	0.609	ND
12/15/18	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 7. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas TCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-19	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
1/27/09	0.183	ND	0.026	0.007	0.007	0.041	nr	0.107	0.727
4/21/09	ND	0.014	0.034	0.107	ND	0.014	1.503	0.218	1.522
7/16/09	ND	ND	ND	ND	ND	0.006	0.260	0.066	0.173
10/28/09	ND	ND	ND	ND	ND	ND	2.570	ND	1.874
1/19/10	ND	ND	ND	ND	ND	ND	1.530	ND	0.331
4/19/10	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/19/10	ND	ND	ND	ND	ND	ND	0.210	ND	ND
10/19/10	ND	ND	ND	ND	ND	ND	ND	0.000	0.000
1/18/11	ND	ND	ND	ND	ND	ND	ND	ND	1.122
4/18/11	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/12/11	ND	ND	ND	ND	ND	ND	0.357	ND	0.124
10/19/11	ND	ND	ND	ND	ND	ND	1.228	ND	1.122
1/24/12	ND	ND	ND	ND	ND	ND	0.217	ND	ND
4/23/12	ND	ND	ND	ND	ND	ND	ND	ND	0.220
7/16/12	ND	ND	ND	ND	ND	ND	0.747	ND	0.895
10/16/12	ND	ND	ND	ND	ND	ND	0.142	ND	0.374
1/14/13	ND	ND	ND	ND	ND	ND	0.807	ND	ND
4/15/13	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/17/13	ND	ND	ND	ND	ND	ND	ND	ND	0.163
11/18/13	ND	ND	ND	ND	ND	ND	0.507	ND	0.213
2/19/14	ND	ND	ND	ND	ND	ND	0.291	ND	0.139
4/22/14	ND	ND	ND	ND	ND	ND	0.672	ND	0.281
8/12/14	ND	ND	ND	ND	ND	ND	0.542	ND	0.490
10/14/14	ND	ND	ND	ND	ND	ND	0.205	ND	ND
2/9/15	ND	ND	ND	ND	ND	ND	0.588	ND	0.457
4/28/15	ND	ND	ND	ND	ND	ND	ND	ND	ND
7/21/15	ND	ND	ND	ND	ND	ND	0.333	ND	0.063
12/8/15	ND	ND	ND	ND	ND	ND	0.147	ND	0.318
2/8/16	ND	ND	ND	0.056	ND	ND	0.612	ND	0.369
5/17/16	ND	ND	ND	ND	ND	ND	0.043	ND	ND
9/13/16	ND	ND	ND	ND	ND	ND	ND	ND	0.074
12/14/16	ND	ND	ND	0.035	ND	ND	0.371	ND	ND
2/14/17	ND	ND	ND	ND	ND	ND	0.371	ND	0.317
5/16/17	ND	ND	ND	ND	ND	ND	0.028	ND	ND
9/14/17	ND	ND	ND	ND	ND	ND	0.049	0.059	ND
12/13/17	ND	ND	ND	ND	ND	ND	0.097	ND	ND
2/13/18	ND	ND	ND	ND	ND	ND	ND	ND	ND
5/15/18	ND	ND	ND	ND	ND	ND	0.378	ND	0.492
9/17/18	ND	ND	ND	ND	ND	ND	ND	ND	0.069
12/15/18	ND	ND	ND	ND	ND	ND	0.261	ND	0.361

Table 7. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas TCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)							
	MCSV-01	MCSV-03A	MCSV-04	MCSV-05	MCSV-06	MCSV-07	MCSV-08	MCSV-09
2/24/04	0.007	0.000	2.310	0.050	0.183	0.547	0.003	0.031
3/16/04	nr	0.009	3.551	nr	0.158	0.577	nr	nr
3/31/04	0.005	0.411	3.085	0.026	0.112	0.306	nr	0.021
6/10/04	NR	0.414	37.345	0.052	0.227	0.098	0.008	0.029
8/5/04	0.008	0.531	11.379	0.030	0.314	0.462	0.006	0.038
9/7/04	0.011	ND	nr	0.023	0.143	0.466	0.020	0.021
12/7/04	0.018	ND	7.119	0.018	0.237	0.389	NR	0.018
1/5/05	0.011	ND	6.190	0.020	0.212	0.350	NR	0.016
2/16/05	nr	ND	5.095	nr	nr	0.340	nr	nr
3/23/05	nr	0.000	6.053	nr	0.171	0.412	nr	nr
7/7/05	nr	0.055	7.373	nr	0.048	3.145	nr	nr
8/30/05	0.007	0.010	14.000	nr	0.162	4.848	nr	nr
9/26/05	0.302	0.034	7.768	nr	0.067	3.705	nr	nr
10/6/05	0.041	0.000	15.478	nr	0.899	5.275	nr	nr
1/30/06	0.483	0.000	5.689	nr	0.123	3.227	nr	nr
5/2/06	0.110	0.000	3.947	nr	0.033	4.997	nr	nr
6/26/06	nr	0.000	8.918	0.572	0.088	3.685	nr	nr
11/15/06	nr	0.000	3.363	0.023	0.062	4.322	nr	0.058
11/30/06	nr	0.000	0.059	0.290	0.269	0.026	nr	0.081
12/15/06	nr	0.000	4.670	0.038	0.118	2.879	nr	0.067
9/27/07	nr	0.000	nr	0.009	0.068	5.439	nr	0.061
4/18/08	0.110	nr	0.020	0.050	0.030	4.354	nr	0.060
6/26/08	nr	nr	0.082	0.013	0.006	4.605	0.009	0.045
9/22/08	0.037	0.212	3.159	0.086	0.052	1.088	0.006	0.064
11/17/08	0.027	0.186	1.332	0.045	0.020	5.909	0.010	0.042

Table 7. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas TCE Results
 (Continued)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-10	MCSV-11	MCSV-12	MCSV-13	MCSV-14	MCSV-15	MCSV-16	MCSV-17	MCSV-18
2/24/04	0.284	0.180	0.251	4.674	0.017	0.037	nr	nr	0.129
3/16/04	0.286	nr	nr	11.465	nr	nr	nr	1.408	nr
3/31/04	0.195	0.085	0.084	6.445	0.012	0.025	nr	0.691	0.163
6/10/04	0.231	0.092	0.148	3.742	0.019	0.030	nr	1.309	nr
8/5/04	0.710	nr	0.204	14.074	0.031	0.043	3.059	nr	nr
9/7/04	0.302	0.103	0.126	10.914	0.035	0.030	nr	3.327	nr
12/7/04	0.220	0.085	0.083	3.696	nr	0.026	nr	1.438	nr
1/5/05	0.226	0.084	nr	9.929	0.008	0.026	nr	2.060	nr
2/16/05	0.207	nr	nr	1.598	nr	nr	nr	0.505	nr
3/23/05	nr	nr	nr	6.681	nr	nr	nr	1.134	nr
7/7/05	0.432	nr	nr	2.594	nr	nr	nr	1.960	nr
8/30/05	0.889	nr	nr	10.232	nr	nr	nr	3.693	nr
9/26/05	0.771	nr	nr	2.250	nr	nr	nr	2.965	nr
10/6/05	1.268	0.517	nr	7.321	nr	nr	nr	3.386	nr
1/30/06	0.481	nr	nr	7.589	nr	nr	nr	4.562	nr
5/2/06	0.236	nr	nr	0.997	nr	nr	nr	3.227	nr
6/26/06	0.255	nr	0.052	4.351	nr	nr	nr	nr	nr
11/15/06	0.521	nr	0.071	3.681	0.042	0.041	0.124	4.416	nr
11/30/06	0.348	nr	0.024	NR	0.831	0.818	0.853	1.247	nr
12/15/06	0.529	nr	0.074	4.217	0.050	0.045	0.203	7.557	nr
9/27/07	1.373	0.104	nr	0.080	0.042	0.039	0.108	8.019	0.267
4/18/08	0.010	ND	0.030	0.076	0.050	0.010	0.020	7.510	0.509
6/26/08	0.264	0.009	0.060	0.588	0.038	0.027	0.065	6.795	0.030
9/22/08	0.070	0.006	0.087	0.088	0.012	0.044	0.043	2.078	0.054
11/17/08	0.245	0.007	0.068	0.033	0.006	0.030	0.006	3.816	0.052

Table 7. MCB MicroBlowers™ and BaroBalls™ Well Exhaust Gas TCE Results
 (Continued/End)

Collection Date	Station ID — PCE Soil-Gas Concentration (ppmV)								
	MCSV-19	MCSV-20	MCSV-21	MCSV-22	MCSV-23	MCSV-24	MCSV-25	MCSV-26	MCSV-27
2/24/04	0.088	0.067	0.207	1.029	0.039	0.059	0.558	0.066	nr
3/16/04	0.117	nr	nr	nr	nr	nr	0.537	0.079	3.061
3/31/04	0.075	0.054	0.159	1.574	0.027	0.043	0.312	0.053	nr
6/10/04	0.094	0.082	0.217	0.477	0.026	0.079	0.168	0.092	nr
8/5/04	0.378	0.195	0.448	0.674	0.066	0.107	0.714	0.189	0.245
9/7/04	0.121	0.083	0.183	2.147	0.029	0.053	nr	0.092	nr
12/7/04	0.121	0.054	0.150	3.766	0.025	0.049	0.130	0.088	2.210
1/5/05	0.082	0.048	0.133	2.533	0.022	0.038	0.199	0.074	2.093
2/16/05	0.066	nr	nr	0.636	nr	nr	0.094	0.080	1.367
3/23/05	0.086	nr	nr	1.289	nr	nr	nr	0.099	nr
7/7/05	0.206	nr	nr	2.413	nr	nr	0.343	0.202	0.195
8/30/05	0.508	nr	nr	4.985	nr	nr	1.023	0.214	2.893
9/26/05	0.331	nr	nr	2.415	nr	nr	0.493	0.306	2.543
10/6/05	0.777	nr	0.179	6.656	nr	nr	2.663	0.814	3.053
1/30/06	0.076	nr	0.282	2.576	nr	nr	0.526	0.449	3.460
5/2/06	0.074	nr	nr	0.932	nr	nr	0.239	0.266	0.537
6/26/06	0.118	nr	0.318	3.603	nr	nr	nr	0.257	0.049
11/15/06	0.163	0.089	0.460	1.334	0.035	0.079	0.393	0.394	0.297
11/30/06	0.099	0.251	0.230	0.637	0.648	0.575	0.243	0.076	0.238
12/15/06	0.229	0.103	0.590	2.456	0.037	0.086	0.483	0.440	0.006
9/27/07	0.229	nr	nr	1.834	0.026	0.077	0.552	nr	0.284
4/18/08	0.030	0.100	0.040	0.030	0.010	nr	0.010	ND	0.540
6/26/08	0.026	0.138	1.251	0.208	0.016	0.045	0.269	0.243	0.993
9/22/08	0.071	0.029	0.786	0.033	0.013	0.013	0.061	0.191	1.949
11/17/08	0.170	0.008	0.244	0.029	0.013	0.028	0.024	0.061	0.434



ND - Non-Detect
 MCSV - Miscellaneous Chemical Soil Vapor
 nr - no result
 - MicroBlower™
 - Capped for Rebound Testing

Table 8. ABRP PSVE Well Performance Sampling Requirements

Sample Location	Sample Media	Sample Parameters	Minimum Frequency*	Comments
PSVE Unit	Vapor	Effluent Flow Rate, Pressure	Quarterly	Air flow per flow meter reading.
		TCE, PCE	Quarterly	Vapor analyses with portable gas analyzer (e.g., B&K or Innova) or other approved equipment/technique.

*Note:

(WSRC 2006)

Minimum frequency may be increased at Design Authority discretion. Actual monitoring does exceed minimum requirements. The MicroBlowers™ are sampled monthly for flowrate and pressure.

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